

Report 3: The Context of VR Services

Influence of the local environment and VR offices on outcomes VR consumers receive as a result of VR services

81% of VR offices are located in communities with ready availability of the Employment Security Commissions

66% reported availability of employment-related services under Javits-Wagner-O'Day Program/JTPA/WIA

72% of offices have access to comprehensive centralized rehabilitation centers



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Influence of the local environment and VR offices on outcomes VR consumers receive as a result of VR services

Communities in which VR offices deliver services range from small towns to large cities. Office catchment areas range from about 60,000 to 250,000 people, averaging about 120,000

Over 60% of VR offices are accessible to mental health, counseling and substance abuse treatment

About half are accessible to vocational training (56%), higher education (51%), and medical services (47%)



Report 3: The Context of VR Services

continued

VR counselors average 11 years in rehabilitation counseling; 41% hold a bachelor's degree; 56% hold a master's degree; 17% hold Certified Rehabilitation Counselor certification

90% of offices have requirements for number of employment outcomes counselors should achieve per year

66% of counselors list "personal commitment to the success of consumers with whom they work" as the most important factor in effective performance of their job



Report 3: Significance (CSAVR determined)

VR consumers achieve success if they have access to employment-related services and higher education, as well as to committed, experienced VR counselors



Report 4: Results of the VR Program

Synthesized all findings to address overall question: Given the relationship among consumer characteristics, contextual factors and VR services, what are the results of the VR program?

- Report 4 summarized data from prior reports, but did not state a final conclusion
- RTI to prepare additional research briefs, a methodology report and public use data files with full documentation



Longitudinal Study of the Vocational Rehabilitation Service Program

CSAVR concludes that the Longitudinal Study data supports the fact that the Public VR Program works

RSA has supported CSAVR efforts to communicate this message

Some initial interest from Wall Street Journal and NPR to tell story

Members of Congress received press release stating study results

Public relations effort moving forward aggressively



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Table 8 - MEAN HOURLY WAGE AT CLOSURE - COMPETITIVE EMPLOYMENT OUTCOMES

2003

AGENCY	STATE	AGENCY TYPE	REGION (RSA #13)	TOTAL CASES - THRU CLOSURE (RSA #13)	TOTAL ANNUAL VISUALLY IMPAIRED OUTCOMES (RSA #2)	PERCENT CLOSED (RSA #11)	TOTAL NUMBER COMP. EMP. (RSA #11)	TOTAL HOURS WORKED PER WEEK (RSA #11)	TOTAL WEEKLY WAIVES (RSA #11)	MEAN HOURLY WAGE (CALC)	DIFF FROM NATIONAL MEAN	DIFF FROM TYPE/AGENCY MEDIAN	NATIONAL RANK	RANK BY TYPE OF AGENCY
001	ALABAMA	C	04	40,707	70,479,027	6.18	7,491	288,803	2,090,178	8.11	-2.43	-1.94	-1.72	79
002	ALABAMA	C	10	3,539	12,923,188	3.53	510	17,334	225,975	13.04	2.49	3.21	3.32	10
004	ARIZONA	C	09	17,249	50,616,774	3.33	1,532	49,913	461,665	9.65	-0.69	-0.40	-0.18	51
005	ARKANSAS	G	08	21,792	37,770,156	0.18	2,226	82,719	788,204	9.45	-0.99	-0.40	-0.18	52
006	CALIFORNIA	C	09	15,246	38,810,945	6.24	1,525	47,874	491,303	10.26	-0.28	0.22	0.44	30
007	COLORADO	C	08	9,043	24,281,978	0.82	1,710	51,578	728,283	14.12	3.58	4.07	4.28	4
008	CONNECTICUT	G	03	4,041	9,582,178	0.51	836	27,339	245,728	8.99	-1.56	-1.06	-0.84	65
009	DELAWARE	G	03	5,065	20,230,531	3.97	724	27,434	287,508	10.48	-0.08	0.63	0.65	31
010	DISTRICT OF COLUMBIA	C	03	60,582	133,938,711	1.07	9,877	340,546	3,353,003	9.79	-0.78	-0.28	-0.04	07
011	FLORIDA	C	04	30,873	68,888,441	4.03	3,558	120,048	1,011,187	8.42	-2.12	-1.62	-1.40	74
012	GEORGIA	C	06	5,896	11,915,935	5.97	555	15,644	158,710	10.02	-0.53	-0.03	0.19	42
014	HAWAII	C	09	11,318	13,831,772	0.88	1,790	57,743	517,288	8.98	-1.59	-1.09	-0.87	67
015	IDAHO	G	10	46,692	124,180,634	7.22	8,555	250,278	2,194,372	8.77	-1.78	-1.28	-1.06	71
016	ILLINOIS	C	05	30,095	78,573,827	5.02	4,487	141,159	1,801,509	11.35	0.80	1.30	1.52	19
017	INDIANA	C	06	22,399	28,604,990	0.42	1,968	62,567	635,128	10.17	-0.58	0.12	0.34	38
018	IOWA	G	07	11,135	28,008,597	6.27	1,675	52,210	440,068	8.43	-2.12	-1.62	-1.40	73
019	KANSAS	C	07	34,253	54,724,865	0.05	4,575	158,804	1,587,429	10.00	-0.55	-0.05	0.17	44
020	KENTUCKY	C	04	18,463	51,873,132	3.71	1,918	66,956	779,831	11.15	0.80	1.10	1.32	20
021	LOUISIANA	C	08	9,516	15,403,388	0.24	838	22,558	218,186	8.58	-0.98	-0.48	-0.24	63
022	MAINE	G	03	18,490	51,873,132	3.02	2,774	90,020	881,505	9.79	-0.75	-0.25	-0.03	48
023	MARYLAND	C	03	31,381	52,621,722	0.77	2,618	78,512	889,049	11.63	1.09	1.58	1.80	18
024	MASSACHUSETTS	G	01	39,608	91,715,415	0.75	6,028	183,258	2,008,839	10.39	-0.15	0.35	0.57	34
025	MICHIGAN	G	05	27,182	45,798,102	0.19	3,179	92,787	949,507	10.24	-0.31	0.19	0.41	37
026	MINNESOTA	C	05	18,463	50,590,975	10.05	4,343	159,947	1,521,811	9.70	-0.65	-0.35	-0.13	49
027	MISSISSIPPI	C	04	35,106	68,631,919	1.02	5,317	170,457	1,512,908	8.87	-1.87	-1.17	-0.95	69
028	MISSOURI	C	07	7,079	12,615,720	4.55	865	28,673	238,484	8.96	-1.57	-1.07	-0.85	66
029	MONTANA	C	08	7,760	17,497,671		1,368	47,671	419,105	8.79	-1.75	-1.25	-1.03	70
030	NEBRASKA	C	07	5,622	16,402,988	9.72	853	29,248	287,305	9.62	-0.72	-0.22	0.00	45
031	NEVADA	C	09	7,190	14,706,530	5.56	1,333	37,872	393,890	10.40	-0.14	0.38	0.59	33
032	NEW HAMPSHIRE	C	01	24,893	47,788,012	0.45	3,898	118,751	1,279,711	10.78	0.23	0.73	0.95	24
033	NEW JERSEY	G	02	8,579	23,206,590	1.10	1,498	46,952	434,425	9.51	-1.23	-0.73	-0.51	62
034	NEW MEXICO	G	06	58,090	178,082,081	0.47	13,873	442,055	4,301,921	9.73	-0.81	-0.31	-0.08	46
035	NEW YORK	G	02	55,258	105,462,329	0.33	8,418	276,741	2,415,832	8.73	-1.81	-1.32	-1.10	72
036	NORTH CAROLINA	C	04	5,890	10,044,464	3.21	803	27,793	264,875	9.54	-1.00	-0.51	-0.29	54
037	NORTH DAKOTA	C	06	41,786	157,496,748	8.54	8,782	223,488	2,417,480	10.82	0.27	0.77	0.99	23
038	OHIO	C	05	26,376	39,887,814	6.49	2,298	78,810	744,119	9.32	-1.22	-0.72	-0.50	61
040	OKLAHOMA	C	06	15,881	38,620,520	0.96	2,703	83,750	839,613	10.03	-0.52	-0.02	0.20	41
041	OREGON	C	10	73,187	151,981,009	3.45	10,485	348,259	3,516,035	10.07	-0.48	0.02	0.24	40
042	PENNSYLVANIA	C	03											19

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Table 9 - MEAN WEEKLY HOURS WORKED AT CLOSURE -- ALL EMPLOYMENT OUTCOMES
2003

AGENCY	STATE	AGENCY TYPE	REGION	TOTAL CASES - TRIAL WORK	TOTAL ANNUAL CLOSURE EXPENDITURES (\$K)	PERCENT CLOSURE VISUALLY IMPAIRED (R&A(1))	TOTAL EMPLOYMENT OUTCOMES (R&A(1))	TOTAL HOURS WORKED (R&A(1))	MEAN WEEKLY HOURS WORKED (CALC)	DIFF FROM NATIONAL MEAN	DIFF FROM TYPE/AGENCY MEAN	NATIONAL RANK	RANK BY TYPE OF AGENCY
001	ALABAMA	C	04	40,707	70,478,027	8.18	7,705	280,543	33.81	4.61	2.30	234	14
002	ALASKA	C	10	3,539	12,923,166	3.53	523	17,442	33.35	4.14	1.93	188	17
004	ARIZONA	C	09	17,249	50,616,774	3.33	1,545	50,146	32.46	3.25	1.03	099	25
005	ARKANSAS	G	06	21,702	37,770,156	0.18	2,228	82,719	37.13	7.82	5.70	506	4
006	CALIFORNIA	C	08	15,248	58,910,845	6.24	1,715	48,754	28.01	-0.20	-2.41	237	43
007	COLORADO	C	01	9,043	24,281,978	0.82	1,722	51,635	29.98	0.78	-1.44	149	35
008	CONNECTICUT	G	03	4,041	9,552,179	0.51	845	27,478	32.52	2.14	1.10	105	24
009	DELAWARE	G	03	5,885	20,230,531	3.97	729	27,494	37.63	6.42	6.21	610	3
010	DISTRICT OF COLUMBIA	C	03	80,562	133,838,711	1.07	10,000	343,148	34.31	5.11	2.88	264	10
011	FLORIDA	G	04	30,873	99,886,441	4.03	4,161	125,730	30.22	1.01	-0.17	121	41
012	GEORGIA	C	06	5,868	11,915,535	5.97	578	15,772	27.24	-1.97	-3.14	423	62
014	HAWAII	C	09	11,318	13,831,772	0.66	1,788	57,743	32.10	2.89	0.87	083	28
015	IDaho	G	10	46,862	124,150,834	7.22	9,057	250,899	27.71	-1.50	-2.66	372	60
016	ILLINOIS	C	05	30,065	78,573,027	5.02	4,818	142,580	29.81	0.40	-0.78	182	48
017	INDIANA	C	05	22,300	26,804,990	0.42	2,086	63,725	30.55	1.34	0.17	092	40
018	IOWA	G	07	11,133	28,008,507	6.27	1,785	52,842	29.53	0.12	-2.10	214	50
019	KANSAS	C	04	34,233	52,388,753	3.71	4,773	159,640	33.45	4.24	2.02	187	18
020	KENTUCKY	G	04	18,571	52,388,753	0.05	1,825	68,958	36.34	7.13	4.92	487	5
021	LOUISIANA	C	06	9,516	15,403,388	0.24	857	22,861	26.88	-2.53	-4.75	480	85
022	MAINE	G	01	18,430	51,873,132	3.02	2,897	90,538	31.25	2.04	0.87	077	33
023	MARYLAND	C	03	31,361	52,821,722	0.77	2,710	77,066	28.45	-0.78	-1.93	202	27
024	MASSACHUSETTS	G	01	39,883	91,715,415	0.75	6,201	185,514	31.89	2.48	0.27	022	56
025	MICHIGAN	G	05	27,132	45,795,102	0.19	3,340	95,968	28.68	-0.53	-1.70	274	28
026	MINNESOTA	G	05	18,483	50,580,975	10.05	4,448	156,947	35.28	6.08	4.90	381	9
027	MISSISSIPPI	C	04	35,108	68,631,919	1.02	5,563	170,457	30.04	1.43	0.28	078	38
028	MISSOURI	G	07	7,079	12,615,720	4.55	925	28,997	29.19	-0.02	-2.24	229	42
029	MONTANA	C	06	7,780	17,487,871	9.72	1,438	48,184	34.25	5.04	2.83	278	12
030	NEBRASKA	G	07	5,852	16,402,888	5.96	861	28,782	33.80	4.60	2.38	233	15
031	NEVADA	C	09	7,180	14,708,530	0.46	1,438	38,258	26.81	-2.60	-4.82	487	86
032	NEW HAMPSHIRE	C	01	24,863	47,783,012	0.46	3,889	118,731	32.19	2.88	1.80	078	21
033	NEW JERSEY	G	02	6,878	23,208,580	1.19	1,531	47,070	30.74	1.54	0.36	088	37
034	NEW MEXICO	G	08	98,000	178,032,061	0.47	15,010	448,945	29.78	0.57	-0.61	185	45
035	NEW YORK	C	02	55,258	103,462,329	0.33	8,503	276,741	32.55	3.34	1.12	107	23
036	NORTH CAROLINA	G	04	5,960	10,044,484	3.21	880	28,021	32.58	3.38	2.20	118	16
037	NORTH DAKOTA	C	06	41,798	157,438,748	8.54	7,034	223,468	31.77	1.39	0.95	030	31
039	OHIO	C	05	38,378	38,987,814	8.48	2,855	80,135	34.03	4.82	2.80	268	13
040	OKLAHOMA	C	06	15,861	36,826,820	0.96	2,717	84,097	30.95	1.74	-0.47	057	34
041	OREGON	G	10	73,187	151,881,008	3.45	11,052	353,583	31.88	2.79	0.57	062	29
042	PENNSYLVANIA	C	03	21,374	84,655,443	8.52	2,441	72,839	29.84	0.83	-0.54	188	44
043	PUERTO RICO	C	02										

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R&A2/113 Data: 9/15/2004
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Table 11 - MEAN WEEKLY WAGE AT CLOSURE - ALL EMPLOYMENT OUTCOMES

2003

TOTAL CASES - TRIAL WORK THRU CLOSURE			AGENCY TYPE	STATE	REGION (RBA 113)	TOTAL ANNUAL EXPENDITURES (RBA2)	PERCENT VISUALLY IMPAIRED (RBA911)	TOTAL EMPLOYMENT OUTCOMES (RBA 911)	TOTAL WEEKLY WAGES (RBA911)	MEAN WEEKLY WAGE (CALC)	DIFF FROM NATIONAL		DIFF FROM TYPE/AGENCY		NATIONAL RANK	RANK BY TYPE OF AGENCY
AGENCY	TYPE	STATE									REGION (RBA 113)	TOTAL ANNUAL EXPENDITURES (RBA2)	PERCENT VISUALLY IMPAIRED (RBA911)	TOTAL EMPLOYMENT OUTCOMES (RBA 911)		
001	C	ALABAMA	04	40,707	70,479,027	8.18	7,705	2,105,628	273.28	-23.38	-17.98	-33.24	-26.84	53	40	
002	C	ALASKA	10	3,530	12,023,168	3.53	523	228,382	432.86	136.21	141.61	126.33	132.73	2	1	
004	C	ARIZONA	08	17,248	50,616,774	3.53	1,545	482,534	312.32	15.68	21.08	5.80	12.20	30	20	
005	G	ARKANSAS	06	21,782	37,770,156	0.18	2,228	801,135	359.58	82.84	68.34	53.08	59.45	10	5	
007	C	COLORADO	08	15,248	38,910,945	5.24	1,715	488,850	280.87	-5.78	-0.37	-15.84	-8.25	41	31	
008	C	CONNECTICUT	01	9,043	24,281,978	0.82	1,722	728,575	423.10	128.48	131.88	118.58	122.88	3	2	
009	G	DELAWARE	03	4,041	9,582,179	0.51	845	248,406	291.80	-5.03	0.37	-14.91	-8.52	40	30	
010	C	DISTRICT OF COLUMBIA	03	5,885	20,230,551	3.97	729	287,508	394.39	97.75	103.15	67.87	94.29	6	4	
011	G	FLORIDA	04	60,562	133,838,711	1.07	10,000	3,344,189	334.42	57.78	43.18	27.80	34.29	21	11	
012	C	GEORGIA	04	30,873	99,888,441	4.03	4,161	1,034,931	248.72	-47.82	-42.82	-57.80	-51.40	63	48	
014	C	HAWAII	09	5,886	11,915,535	6.97	679	157,370	271.80	-24.84	-18.44	-34.72	-28.33	56	43	
015	G	IDAHO	10	11,318	13,631,772	0.68	1,789	517,288	287.53	-9.11	-3.71	-18.98	-12.59	44	33	
016	C	ILLINOIS	05	46,862	124,180,634	7.22	9,057	2,188,886	242.54	-54.10	-48.70	-63.88	-57.58	67	51	
017	G	INDIANA	05	30,066	78,573,027	5.02	4,818	1,007,231	333.59	98.85	42.35	27.07	33.47	22	12	
018	C	IOWA	07	22,308	28,804,660	0.42	2,088	638,865	308.85	10.01	15.41	0.13	6.52	33	23	
019	C	KANSAS	07	11,133	26,008,597	0.27	1,785	441,547	285.89	-50.86	-45.25	-60.53	-54.14	64	49	
020	C	KENTUCKY	04	34,253	54,724,885	0.05	4,773	1,590,595	333.25	98.61	42.01	26.79	33.13	23	13	
021	C	LOUISIANA	06	19,571	52,386,753	3.71	1,925	779,831	405.11	108.47	113.67	98.59	104.88	5	3	
022	G	MAINE	01	8,516	15,403,388	0.24	867	217,535	253.83	-42.81	-37.41	-52.89	-46.28	62	47	
023	C	MARYLAND	03	18,430	51,873,132	3.02	2,867	883,513	300.06	8.34	13.74	-1.54	4.86	35	25	
024	G	MASSACHUSETTS	01	31,351	52,821,722	0.77	2,710	694,405	320.04	33.40	36.80	23.52	26.55	26	15	
025	G	MICHIGAN	05	38,003	91,715,415	0.75	6,201	2,016,512	325.86	28.04	34.44	19.16	25.92	27	17	
026	G	MINNESOTA	05	27,152	45,788,102	0.19	3,340	898,886	288.88	-9.78	-4.36	-19.64	-13.25	45	34	
027	C	MISSISSIPPI	04	18,483	50,580,975	10.05	4,448	1,521,611	342.09	45.45	50.65	35.57	41.97	20	10	
028	G	MISSOURI	07	35,108	68,051,919	1.02	5,563	1,512,308	271.85	-24.79	-19.39	-34.87	-28.27	55	42	
029	C	MONTANA	08	7,079	12,615,729	4.55	925	240,884	259.89	-38.85	-31.25	-48.53	-40.13	60	45	
030	G	NEBRASKA	07	7,780	17,467,671	0.71	1,436	424,565	288.86	-0.86	4.42	-10.86	-4.46	38	28	
031	C	NEVADA	09	5,882	18,402,986	9.72	881	289,725	328.86	52.22	57.82	22.34	28.74	26	16	
032	C	NEW HAMPSHIRE	01	7,160	14,708,539	5.88	1,438	385,888	275.29	-21.35	-15.86	-31.23	-24.83	52	39	
033	G	NEW JERSEY	02	24,863	47,783,012	0.46	3,689	1,279,711	348.90	50.28	55.68	40.38	46.78	17	7	
034	G	NEW MEXICO	08	8,879	23,208,580	1.10	1,331	435,772	264.83	-12.01	-6.61	-21.86	-15.49	48	36	
035	G	NEW YORK	02	98,080	178,032,081	0.47	15,010	4,318,983	287.72	-8.92	-3.52	-18.80	-12.40	43	32	
036	G	NORTH CAROLINA	04	55,259	103,462,339	0.93	8,503	2,415,832	284.12	-12.52	-7.12	-22.40	-16.01	49	37	
037	C	NORTH DAKOTA	08	5,880	10,044,464	3.21	860	265,832	308.11	12.47	17.87	2.99	8.98	32	22	
038	C	OHIO	05	41,786	157,438,748	8.54	7,034	2,417,490	343.66	47.04	52.44	37.16	43.58	18	8	
039	C	OKLAHOMA	08	28,378	58,887,814	8.49	2,355	744,987	316.30	19.88	25.08	9.79	16.18	29	19	
040	C	OREGON	10	15,881	36,828,520	0.98	2,717	841,344	309.66	13.02	18.42	3.14	9.54	31	21	
042	C	PENNSYLVANIA	03	73,187	151,881,009	3.45	11,052	3,335,242	319.87	23.23	28.63	13.95	19.75	28	18	
043	C	PUERTO RICO	02	21,374	84,665,443	8.82	2,441	658,143	228.85	-47.88	-42.88	-77.87	-71.47	71	52	
044	C	RHODE ISLAND	01	5,887	11,250,060	5.25	805	184,569	272.05	-46.11	-41.51	-56.46	-50.07	54	41	
045	G	SOUTH CAROLINA	04	39,139	67,839,173	0.80	9,128	3,127,974	342.75	48.11	51.51	36.24	42.63	19	9	
046	G	SOUTH DAKOTA	08	5,150	10,548,618	0.08	751	182,843	243.20	-53.44	-48.04	-63.30	-56.82	68	50	
047	C	TENNESSEE	04	41,187	72,833,137	3.83	3,557	1,004,578	286.29	2.86	8.05	-7.23	-0.83	37	27	

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2003

2003

TOTAL CABLES - TRAIL	AGENCY TYPE	STATE	REGION	THRU CLOSURE (RGA 113)	TOTAL ANNUAL EXPENDITURES (RGA2)	PERCENT CLOSED VISUALLY IMPAIRED (RGA911)	TOTAL NUMBER COMP. EMPLOYMENT OUTCOMES (RGA911)	TOTAL WEEKLY WAGES (RGA911)	MEAN WEEKLY WAGE (CALC)	DIFF FROM NATIONAL		DIFF FROM TYPE/AGENCY		RANK BY TYPE OF AGENCY	
										MEAN	MEDIAN	MEAN	MEDIAN		
001	C	ALABAMA	04	40,707	70,479,027	6.16	7,461	2,068,176	281.35	-57.47	-50.73	-36.55	-31.16	70	44
002	C	ALASKA	10	3,539	12,825,168	3.53	510	225,978	443.09	104.26	111.01	126.19	130.58	6	1
004	C	ARIZONA	09	17,249	50,616,774	3.33	1,532	461,868	314.40	-24.42	-17.68	-3.50	1.89	48	28
005	C	ARKANSAS	08	21,762	57,770,159	0.16	2,226	798,204	358.58	19.78	26.50	40.68	46.07	21	6
006	C	CALIFORNIA	09	15,246	36,910,845	5.24	1,525	491,303	322.17	-16.66	-9.92	4.26	9.65	46	24
007	C	COLORADO	08	9,043	24,261,978	0.62	1,710	726,283	426.80	87.07	93.81	107.89	113.38	10	2
008	G	CONNECTICUT	01	4,041	9,542,178	0.51	836	245,728	263.93	-44.69	-38.15	-23.97	-18.58	59	36
009	G	DELAWARE	03	5,685	20,230,831	3.97	724	287,508	397.11	58.28	65.03	79.21	84.60	13	4
010	C	DISTRICT OF COLUMBIA	03	80,582	133,938,711	1.07	9,877	3,333,003	337.45	-1.36	5.37	19.55	24.94	36	15
011	G	FLORIDA	04	30,873	99,888,441	4.03	3,558	1,011,187	284.36	-54.47	-47.72	-33.54	-28.15	66	42
012	C	GEORGIA	04	5,868	11,916,835	5.87	565	158,710	282.36	-56.47	-49.72	-35.54	-30.15	69	43
014	C	HAWAII	08	11,518	13,891,772	0.88	1,790	517,268	268.96	-48.95	-43.11	-28.93	-23.54	62	38
015	G	IDAHO	10	46,862	124,180,684	7.22	8,567	2,194,372	258.50	-82.32	-75.58	-61.40	-56.01	76	50
016	C	ILLINOIS	05	30,085	78,673,627	5.02	4,487	1,001,506	356.62	18.10	24.84	59.02	44.41	22	7
017	C	INDIANA	05	22,309	28,604,980	0.42	1,988	636,126	323.24	-15.59	-8.85	5.33	10.72	45	23
018	G	IOWA	07	11,133	29,006,507	0.27	1,675	440,086	262.73	-78.10	-68.39	-55.18	-49.79	74	48
019	C	KANSAS	07	34,233	54,724,865	0.05	4,575	1,587,429	346.98	8.15	14.80	29.08	34.47	29	11
020	G	KENTUCKY	04	18,571	52,368,753	3.71	1,918	779,831	408.59	67.78	74.50	88.68	94.07	12	3
021	C	LOUISIANA	08	9,516	15,403,368	0.24	836	216,168	257.95	-80.87	-74.13	-59.85	-54.56	75	49
022	G	MAINE	01	18,450	51,873,132	3.02	2,774	881,506	317.77	-21.05	-14.51	-0.13	5.26	47	25
023	C	MARYLAND	03	31,381	52,871,722	0.77	2,818	889,849	339.90	1.07	7.81	21.99	27.39	53	14
024	G	MASSACHUSETTS	01	39,603	91,716,415	0.73	6,026	2,008,839	333.36	-5.48	1.26	15.46	20.85	40	19
025	G	MICHIGAN	06	27,132	45,798,102	0.19	3,179	949,507	288.66	-40.14	-33.40	-19.22	-13.83	57	34
026	G	MINNESOTA	06	18,483	50,590,975	10.05	4,343	1,521,611	350.36	11.53	16.26	32.46	37.85	26	9
027	C	MISSISSIPPI	04	35,106	88,631,919	1.02	5,317	1,512,508	284.43	-54.40	-47.65	-33.48	-28.08	65	41
028	C	MISSOURI	07	7,079	12,615,720	4.55	885	239,484	270.90	-68.22	-61.46	-47.50	-41.91	72	46
029	C	MONTANA	08	7,079	12,615,720	4.55	885	239,484	270.90	-68.22	-61.46	-47.50	-41.91	72	46
030	G	NEBRASKA	07	7,780	17,467,671	0.72	1,388	418,165	302.36	-38.44	-28.70	-15.52	-10.13	56	33
031	C	NEVADA	09	5,862	16,402,966	9.72	863	284,875	329.66	-8.97	-2.23	11.95	17.34	42	21
032	C	NEW HAMPSHIRE	01	7,180	14,708,530	5.58	1,353	383,900	295.52	-43.30	-36.56	-22.38	-18.09	58	35
033	G	NEW JERSEY	02	24,863	47,783,012	0.45	3,669	1,278,711	348.79	9.98	16.71	30.89	36.28	28	10
034	G	NEW MEXICO	08	8,879	23,208,580	1.10	1,498	434,425	290.00	-48.82	-42.08	-27.80	-22.51	61	37
035	G	NEW YORK	02	98,090	178,032,061	0.47	13,873	4,301,821	310.08	-28.73	-21.89	-7.81	-2.42	50	28
036	G	NORTH CAROLINA	04	55,259	103,482,329	0.33	8,416	2,415,832	298.96	-51.84	-45.10	-30.92	-25.53	63	39
037	C	NORTH DAKOTA	06	5,980	10,044,494	3.21	803	284,875	329.66	-8.97	-2.23	11.95	17.34	42	21
038	C	OHIO	05	41,798	157,436,748	8.54	6,782	2,417,480	338.45	17.63	24.37	38.55	43.94	23	8
040	C	OKLAHOMA	06	26,378	38,987,814	6.49	2,266	744,118	326.38	-10.44	-3.70	10.48	15.87	43	22
041	G	OREGON	10	15,881	38,628,620	0.96	2,703	839,613	310.62	-28.20	-21.46	-7.28	-1.89	49	27
042	C	PENNSYLVANIA	03	73,167	161,961,008	3.45	10,485	3,516,055	385.98	-2.85	3.80	18.08	23.47	58	17
043	C	PUERTO RICO	02	21,374	84,655,443	8.52	2,231	550,802	246.86	-91.94	-85.20	-71.02	-65.63	77	51

R911 Data: 7/12/2004
 R9A2/113 Data: 9/16/2004
 RC-82

FY 2003

Table 6: PERCENT OF ALL EMPLOYMENT OUTCOMES THAT ARE COMPETITIVE EMPLOYMENT OUTCOMES

2003

AGENCY	STATE	AGENCY TYPE	REGION	TOTAL CASES - TRIAL WORK THRU	TOTAL ANNUAL EXPENDITURES (RBA2)	PERCENT CLOSED VISUALLY IMPAIRED (RBA11)	TOTAL NUMBER EMPLOYMENT OUTCOMES (RBA11)	TOTAL NUMBER COMP EMPLOYMENT OUTCOMES (RBA11)	PERCENT COMP EMPLOYMENT OUTCOMES (CALC)	DIFF FROM NATIONAL MEAN	DIFF FROM TYPE/AGENCY MEAN	DIFF FROM NATIONAL MEDIAN	NATIONAL RANK	RANK BY TYPE OF AGENCY
001	ALABAMA	C	04	40,707	70,478,027	6.18	7,705	7,461	96.83	9.01	1.73	1.00	0.12	27
002	ALASKA	C	10	3,559	12,923,188	3.53	523	510	97.51	9.89	2.42	1.68	0.80	24
004	ARIZONA	C	09	17,249	50,616,774	3.33	1,545	1,532	99.16	11.33	4.06	3.33	2.45	12
005	ARKANSAS	G	06	21,782	37,770,158	0.18	2,228	2,228	99.91	12.08	4.61	4.08	3.20	2
006	CALIFORNIA	C	08	94,799	222,234,798	7.48	15,438	15,438	100.00	13.15	5.15	4.42	3.70	1
007	COLORADO	C	08	15,248	38,910,945	5.24	1,715	1,625	94.92	1.09	-6.18	-6.81	-7.79	57
008	CONNECTICUT	G	01	9,043	24,281,978	0.62	1,722	1,710	99.30	11.48	4.20	3.47	2.59	8
009	DELAWARE	G	03	4,041	9,582,179	0.51	845	836	98.03	11.11	3.84	3.10	2.22	14
010	DISTRICT OF COLUMBIA	C	03	5,685	20,230,531	3.97	729	724	99.31	11.49	4.22	3.46	2.60	8
011	FLORIDA	C	04	80,582	133,938,711	1.07	10,000	9,877	98.77	10.94	3.87	2.84	2.09	15
012	GEORGIA	C	04	30,573	90,888,441	4.03	4,161	3,568	85.48	-2.37	-8.64	-10.37	-11.25	59
014	HAWAII	C	09	5,886	11,915,535	5.87	579	565	97.58	8.03	0.76	0.02	-0.86	35
015	IDAHO	C	10	11,318	13,631,772	0.88	1,789	1,780	99.50	11.87	4.40	3.67	2.79	5
016	ILLINOIS	C	05	46,892	124,190,634	7.22	9,057	8,556	94.46	6.83	-0.64	-1.37	-2.28	44
017	INDIANA	C	05	30,085	76,573,627	5.02	4,818	4,487	93.13	5.30	-1.97	-2.70	-3.58	51
018	IOWA	C	07	22,309	28,604,860	0.42	2,066	1,968	94.94	6.52	-0.78	-1.49	-2.37	46
019	KANSAS	C	07	11,133	28,008,507	6.27	1,785	1,675	93.31	5.48	-1.78	-2.52	-3.40	50
020	KENTUCKY	G	04	34,233	54,724,885	0.05	4,773	4,575	95.85	8.02	0.75	0.02	-0.86	36
021	LOUISIANA	C	06	18,571	52,385,753	3.71	1,925	1,918	99.64	11.81	4.54	3.80	2.92	4
022	MAINE	G	01	9,516	15,403,368	0.24	857	838	97.78	9.95	2.68	1.95	1.07	21
023	MARYLAND	C	03	18,430	51,873,132	3.02	2,897	2,774	95.75	7.93	0.86	-0.08	-0.86	37
024	MASSACHUSETTS	G	01	31,361	52,821,722	0.77	2,710	2,616	96.61	8.78	1.51	0.77	-0.11	29
025	MICHIGAN	G	05	38,603	91,715,415	0.75	6,201	6,026	97.18	9.35	2.06	1.35	0.46	26
026	MINNESOTA	G	05	27,132	45,788,102	0.19	3,346	3,179	95.01	7.18	-0.09	-0.82	-1.70	41
027	MISSISSIPPI	C	04	18,463	50,590,975	10.05	4,448	4,343	97.64	9.81	2.54	1.81	0.93	22
028	MISSOURI	G	07	35,108	68,681,919	1.02	5,583	5,317	95.08	7.75	0.46	-0.25	-1.14	38
029	MONTANA	C	06	7,078	12,615,720	4.55	925	895	96.88	7.85	0.58	-0.18	-1.04	39
030	NEBRASKA	G	07	7,780	17,487,871	1.43	1,438	1,398	96.52	8.99	1.42	0.69	-0.20	30
031	NEVADA	C	09	5,652	16,402,968	9.72	891	853	95.82	8.99	1.72	0.99	0.11	28
032	NEW HAMPSHIRE	C	01	7,100	14,708,530	5.56	1,438	1,333	92.70	4.87	-2.40	-3.13	-4.02	52
033	NEW JERSEY	G	02	24,869	47,783,012	0.45	3,889	3,869	99.46	11.83	4.39	3.63	2.74	7
034	NEW MEXICO	G	08	8,879	23,208,580	1.10	1,531	1,498	97.84	10.02	2.75	2.01	1.13	20
035	NEW YORK	G	02	90,090	178,032,081	0.47	15,010	13,873	92.43	4.60	-2.87	-3.41	-4.29	53
036	NORTH CAROLINA	G	04	55,259	103,462,328	0.33	8,503	8,418	99.00	11.17	3.90	3.17	2.29	13
037	NORTH DAKOTA	C	06	5,960	10,044,464	3.21	800	803	99.37	5.54	-1.73	-2.46	-3.34	49
039	OHIO	C	05	41,798	157,436,748	6.54	7,034	6,782	96.42	8.99	1.32	0.59	-0.30	31
040	OKLAHOMA	C	06	26,378	38,967,814	6.48	2,565	2,288	89.22	8.38	1.12	0.38	-0.48	32
041	OREGON	G	10	15,881	36,826,620	0.86	2,717	2,703	99.48	11.86	4.39	3.65	2.77	6
042	PENNSYLVANIA	C	03	73,187	151,981,008	3.45	11,052	10,485	94.89	8.88	-0.41	-1.14	-2.02	43

RS11 Data: 7/12/2004
 RSA2/113 Data: 9/16/2004
 RC-18

November 2005

NATIONAL LONGITUDINAL
TRANSITION STUDY 2

Facts From NLTS2

High School Completion by Youth With Disabilities

Whether youth complete high school or leave without finishing can be associated with both economic and social disadvantages, with dropouts experiencing a higher likelihood of unemployment and arrest and lower life-time earnings than graduates (U.S. Department of Commerce 2004; Office of Juvenile Justice and Delinquency Prevention 1995). Data regularly collected by the U.S. Department of Education on high school completion and dropout rates for the general population show that school completion is less common among some demographic groups than others, including those from lower-income households and students who are Hispanic, for example (U.S. Department of Education 2005). Similar national data for students with disabilities are not routinely collected,¹ so trends in school-leaving status and differential school completion rates for different demographic groups among youth with disabilities are unknown.

Data from the National Longitudinal Transition Study-2 (NLTS2)² are designed to provide a national picture³ of the rate at which secondary school students with disabilities complete high school and how they fare in their early postschool years. Further, comparisons of findings from NLTS2 and the original NLTS⁴ enables an investigation of changes in school completion rates from 1987 through 2003.

This fact sheet was prepared for the Institute of Education Sciences under Contract No. ED-01-CO-0003. The project officer is Patricia Gonzalez in the National Center for Special Education Research.

¹ The Office of Special Education Programs of the U.S. Department of Education regularly reports data on the ways in which students with disabilities exit special education (U.S. Department of Education 2003), which can include dropping out, graduating, and reaching the maximum age for special education services, but those figures are confounded with other modes of leaving special education, such as returning to general education classes.

² The National Longitudinal Transition Study-2 (NLTS2) has a nationally representative sample of more than 11,000 students who were in at least seventh grade and receiving special education services in the 2000-01 school year. This sample represents a total of 1,838,848 youth with disabilities, according to federal child count figures (U.S. Department of Education 2002). Twenty-eight percent of the youth represented in NLTS2, or about half a million youth, had left school by spring 2003, when parents and youth were interviewed.

³ Data reported here are population estimates from data weighted to represent students in each disability category who attended school in the kinds of districts from which they were sampled.

⁴ The National Longitudinal Transition Study was conducted by SRI International (SRI) for OSEP from 1985 through 1993. SRI is conducting NLTS2 currently. For comparisons with NLTS2, statistical adjustments were made to the studies' samples to include only same-age youth. In both samples used in these analyses, 19% of youth are 15 through 17, 31% are 18, and 50% are 19. In addition, the composition of some disability categories was adjusted so that categories were defined similarly at the two time points (e.g., the separate categories of deaf and hearing impaired that were in use in 1987 were combined in these analyses to be comparable to the single category of hearing impairment in use in 2001). See Wagner, Newman, Cameto, and Levine (2005), for additional details on adjustments to the studies' samples and findings regarding changes over time in outcomes of youth with disabilities.

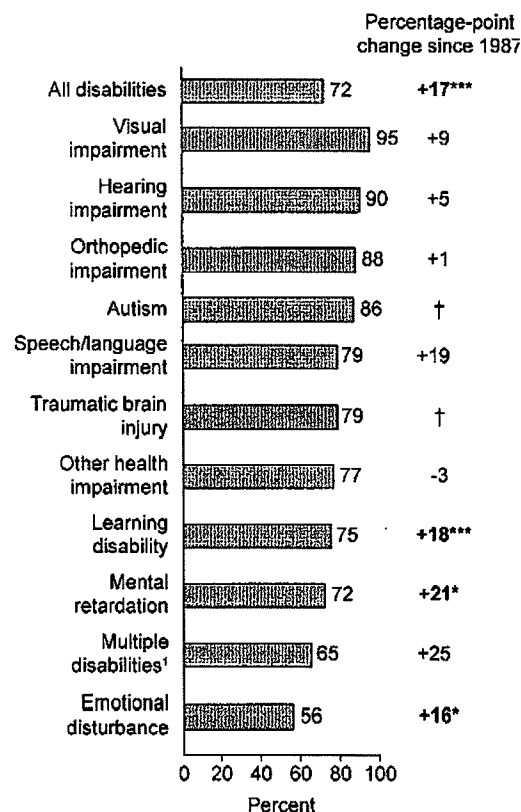
School Completion Status

Parents' interview responses in 2003 indicate that 72 percent of out-of-school⁵ youth with disabilities complete high school⁶ by receiving either a regular diploma or a certificate of completion or similar document (figure 1).⁷ The rate of high school completion in that same year for youth with disabilities overall was 17 percentage points higher than the rate in 1987.⁸ Among the 28 percent who do not complete high school, the most common reasons reported are their dislike of their school experience (36 percent) and poor relationships with teachers and students (17 percent).

Disability Category Differences⁹

School completion rates are quite high among youth with visual or hearing impairments (95 percent and 90 percent, respectively), as well as among those with orthopedic impairments (88 percent) or autism (86 percent). However, because these are low-incidence categories of disability (e.g., NLTS2 represents about 22,000 youth with hearing impairments, slightly fewer youth with orthopedic impairments, almost 15,000 youth

Figure 1. Reported high school completion status, by federal statutory disability category



* $p < .05$, *** $p < .001$.

† Not applicable; these categories were not in use in 1987.

¹ Includes the category of deaf-blindness.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), "Wave 2 Parent/Youth Interview, 2003."

⁵ Approximately 1,220 NLTS2 sample members were out of school, including almost 900 graduates and approximately 325 dropouts.

⁶ The school completion rate is the number of youth who were reported by parents in Wave 2 telephone interviews (2003) no longer to be attending high school and who left high school by receiving a regular diploma or certificate of completion, divided by the total number of youth reported no longer to be attending high school. Youth were ages 15 through 19.

⁷ These school completers are referred to as graduates in the remainder of this fact sheet.

⁸ The statistical significance of differences between groups and of changes over time was determined by two-tailed F tests.

⁹ The terminology for classifying students who receive special education services that is used here is specified in federal regulations for the implementation of the Individuals with Disabilities Education Act Amendments of 1997 (P.L. 105-17), 111 Stat. 37-157 (Knoblauch and Sorenson 1998).

with autism, and about 8,000 youth with visual impairments), their relatively high rates of school completion do not affect the average for all youth with disabilities to the extent that rates for higher-incidence categories do. For example, the school completion rate is 75 percent for the largest category, learning disability (NLTS2 represents more than 1,130,000 youth with learning disabilities). School completion rates for youth in four other categories are between 72 percent and 79 percent. Lower rates are apparent for youth

with multiple disabilities or deaf-blindness and youth with emotional disturbances, among whom 65 percent and 56 percent are high school completers, respectively.

Significant increases in school completion are noted for three of the four disability categories whose members had the lowest school completion rates in 1987: learning disability (18 percentage points), mental retardation (21 percentage points), and emotional disturbance (16 percentage points).¹⁰

Demographic Differences

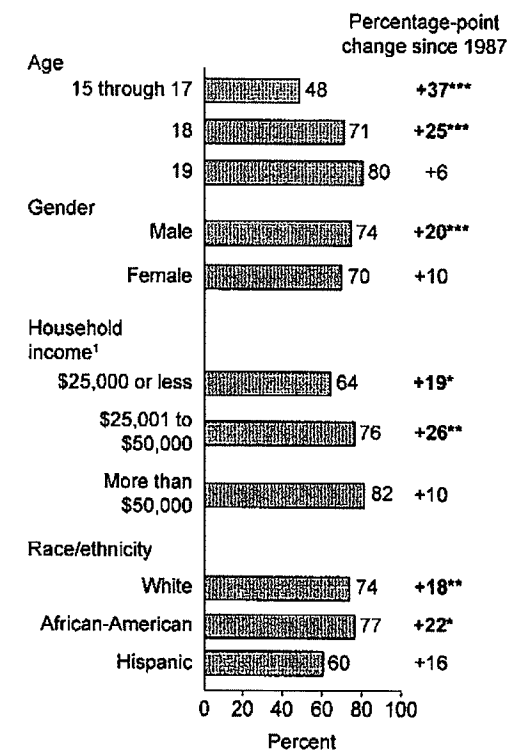
Differences in the rate at which out-of-school youth with disabilities complete high school are apparent for groups who differ in selected demographic characteristics (figure 2).

Age. Not surprisingly, the lowest high school completion rate (48 percent) occurs among youth with disabilities who were ages 15 through 17 and not in school, ages at which most youth typically still would be in high school. However, this youngest group experienced the largest increase over time in the likelihood of finishing school (37 percentage points).

The high school completion rate is significantly higher among 18-year-olds than 15- through 17-year-olds—71 percent—a 25-percentage-point increase since 1987. The school completion rate is highest (80 percent) among out-of-school 19-year-olds with disabilities, although this is not a significantly higher rate than in 1987.

Household income. The completion rate is significantly higher among youth with disabilities from wealthier households (i.e., with incomes of more than \$50,000) than

Figure 2. High school completion status of youth with disabilities, by demographic characteristics



* $p < .05$, ** $p < .01$, *** $p < .001$.

¹ For comparisons with 1987, the income distribution in both years is divided into equal thirds to create a common metric for the 2 years.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), "Wave 2 Parent/Youth Interview, 2003."

among low-income youth (82 percent vs. 64 percent), an income-related difference that also is apparent in the general population (Kaufman, Alt, and Chapman 2001). However, both the lowest and middle income groups show significant increases over time in their school completion rates (19 and 26 percentage points, respectively), an increase not shared by the highest income group.

Race/ethnicity. Although Hispanic youth with disabilities appear to have a lower rate of school completion than White or African-American peers (60 percent vs. 74 percent and

¹⁰ Increases among youth in the speech/language impairment and multiple disabilities/deaf-blindness categories do not reach statistical significance, possibly because of the small sizes or large standard errors of those groups.

77 percent), this difference is not statistically significant. Similarly, although all three racial/ethnic groups demonstrate similar increases over time in their school completion rates, only the increases for White and African-American youth with disabilities reach statistical significance (18 and 22 percentage points, respectively).

Gender. No differences are noted in the school completion rates of boys and girls with disabilities. However, boys show a statistically significant increase over time that is not evident for girls (20 vs. 10 percentage points for boys and girls, respectively).

What Happens Next?

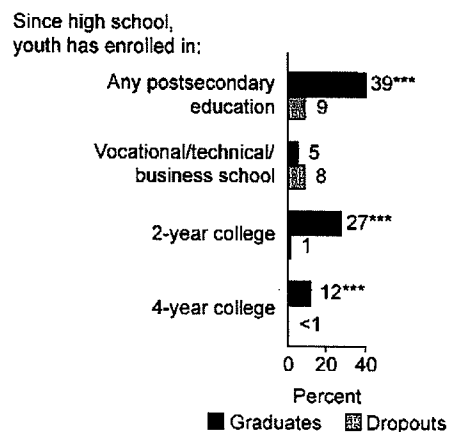
The period that extends from the end of high school through a youth's twenties challenges youth with decisions regarding education, careers, marriage, and parenting; demands for financial and residential independence; and the myriad responsibilities (legal, social, and personal) that accompany adulthood (Osgood et al. 2005). In the first few years after high school, the paths into young adulthood of youth with disabilities who finish high school diverge in important ways from those followed by youth with disabilities who do not finish high school. The following sections focus on youth with disabilities who had been out of school from a few weeks up to 2 years and describes their activities in the areas of education, employment, independence, and community participation.¹¹

Participation in high school diploma/certificate programs. Dropping out of school is not an irrevocable decision. Young people may still obtain a high school diploma by reentering a regular or alternative secondary school program or by taking an examination to obtain a General Educational Development

(GED) credential. Up to 2 years after leaving high school, 29 percent of youth with disabilities who had dropped out had taken one or more classes or tests to earn a high school diploma, and almost one-third of those program participants had earned a high school diploma or certificate—i.e., 9 percent of all dropouts with disabilities. Although obtaining a GED or following another degree path does not overcome the labor market disadvantage for dropouts compared with graduates, GED holders in the general population have been found to earn higher wages than uncredentialed dropouts (Tyler 2003).

Postsecondary school enrollment. One of the clearest advantages of finishing high school is that it provides the necessary foundation for pursuing most postsecondary education opportunities, which is critically important if youth with disabilities are to participate fully in an economy that is increasingly knowledge based. The advantage of finishing high school is evident in the rates of postsecondary school enrollment of youth with disabilities (figure 3).

Figure 3. Postsecondary education enrollment of youth with disabilities, by high school completion status

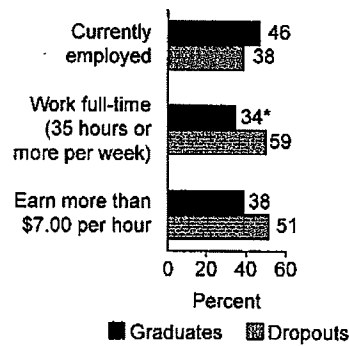


***p < .001.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), "Wave 2 Parent/Youth Interview, 2003."

¹¹ A more detailed account of the experiences of youth with disabilities in the first years after high school is available in Wagner, Newman, Cameto, Garza, et al. (2005).

Figure 4. Employment experiences of youth with disabilities, by high school completion status



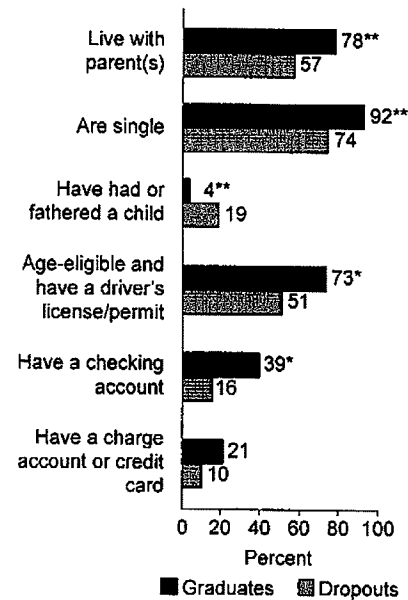
* $p < .05$.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), "Wave 2 Parent/Youth Interview, 2003."

Within 2 years of leaving high school, 39 percent of graduates with disabilities enroll in some kind of postsecondary education institution, more than four times the enrollment rate of dropouts (9 percent). Two-year or community colleges are the most popular kind of postsecondary school among graduates; 27 percent of graduates enroll in such schools. In contrast, high school dropouts are most likely to attend vocational, technical, or business schools; 8 percent of dropouts do so. About 1 in 8 graduates enroll in a 4-year college; not surprisingly, virtually no dropouts do.

Employment. The advantages that accrue to high school graduates with disabilities in the postsecondary education arena are not evident in the employment domain in the first years after high school (figure 4). There is no statistically significant difference between those who do and do not finish high school in the likelihood of working for pay outside the home; 46 percent of graduates are working, as are 38 percent of dropouts. Neither do the hourly wages of the two groups differ; 38 percent of graduates with disabilities and 51 percent of dropouts earn more than \$7.00

Figure 5. Independence and family formation of youth with disabilities, by high school completion status



* $p < .05$, ** $p < .01$.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2), "Wave 2 Parent/Youth Interview, 2003."

per hour. However, graduates are much less likely than dropouts to work full-time (34 percent vs. 59 percent), in part because graduates are more likely than dropouts to be attending a postsecondary school.

Independence. Both youth with disabilities who finished high school and those who did not begin to demonstrate several aspects of adult independence in their first few years after high school (figure 5).

About three-fourths (78 percent) of high school graduates are living with one or both parents up to 2 years after high school. The large majority of graduates (92 percent) are single, and few (4 percent) have had or fathered a child. In contrast, significantly fewer high school dropouts with disabilities (57 percent) live with parents. Similarly, many fewer dropouts (74 percent) are single, and

almost five times as many dropouts as graduates are parents (19 percent).

Even though dropouts are more likely than graduates to be living independently and to have the responsibilities of parenthood, they are less likely to have the mobility that comes with having driving privileges. Almost three-fourths (73 percent) of age-eligible graduates with disabilities have a driver's license or permit, compared with about half (51 percent) of dropouts. Dropouts also are less likely than graduates to have one of the financial management tools that are markers of adulthood—a checking account (16 percent vs. 39 percent).

Community participation. NLTS2 has investigated several aspects of community participation by youth with disabilities, including taking part in organized community groups and in volunteer or community service activities. Overall, 31 percent of graduates with disabilities take part in organized community groups within 2 years of finishing high school, and 30 percent take part in volunteer or community service activities. This is not significantly different from the 19 percent and 18 percent of dropouts who are thus engaged. Taking part in the political process through voting is another positive form of community participation. In the early years after high school, 69 percent of graduates with disabilities are registered to vote, significantly more than the 48 percent of dropouts who are.

Summing Up

There has been an increase over time in the percentage of youth with disabilities who complete high school; according to NLTS2, 72 percent achieve that milestone. However, this mark of success is much more common for some youth than others. Those with sensory or orthopedic impairments finish school at much higher rates, for example, than youth with multiple disabilities or emotional

disturbances. Hispanic youth with disabilities and those from the lowest-income households also lag behind others in their high school completion rates.

Whether youth with disabilities finish or drop out of high school is associated with marked differences in their experiences in the early postschool years. A high school diploma gives graduates with disabilities access to a college education that is unavailable to most dropouts. Although the two groups are equally likely to be working for pay after high school, dropouts work longer hours, on average, thereby generating greater income.

But the decision to drop out of high school is reversible. About 3 in 10 dropouts with disabilities pursue a high school diploma within 2 years of first leaving school, and about one-third of those youth with disabilities earn their high school credential in that time period.

Looking Ahead

This report on the school completion status of youth with disabilities focuses on the very early years after they leave high school. Because NLTS2 is longitudinal, it offers the opportunity to revisit the question of how graduates and dropouts with disabilities fare as they transition to adulthood, including, for example, whether larger proportions of dropouts eventually earn a diploma or completion certificate or obtain postsecondary education, and how the earnings of graduates and dropouts compare as they have greater experience in the labor market.

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Competitive Employment for People With Autism:

Correlates of Successful Closure in Competitive and Supported Employment

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Differences in rates of case closure, case service cost, hours worked per week, and weekly wage between customers with autism closed successfully in competitive employment and supported employment were found using the Rehabilitation Service Administration national database of 2001. Using logistic regression, customer demographic variables related to successful competitive employment included age, years of education, and presence of a secondary disability. Case service variables related to successful competitive employment included job finding, job placement, and maintenance. Of customer demographic variables related to successful supported employment, White customers were more likely to be closed successfully. Job placement was the case service variable related to successful supported employment. Implications for rehabilitation professionals and for future research on vocational rehabilitation outcomes with customers with autism are provided.

Competitive employment in community-based settings for individuals with autism was once thought to be unlikely (Mawhood & Howlin, 1999; Nesbitt, 2000; Smith, Belcher, & Juhrs, 1995). Now, with technologies and support services to successfully assist individuals with autism to work in competitive employment, more people with autism are benefiting from state and federal rehabilitation services. As a result, experience has demonstrated that individuals with autism can work in a variety of community-based businesses and industries (McCarthy, Fender, & Fender, 1988; Muller, Schuler, Burton, & Yates, 2003; Smith et al., 1995).

Autistic disorder, or autism, was once thought to be a psychiatric disorder (American Psychiatric Association, 2000; Ozonoff, Rogers, & Hendron, 2003). Currently, autism is defined as a developmental disability and is one of five disorders grouped under the category of pervasive developmental disorders (PDD) in the *Diagnostic and Statistical Manual-Fourth Edition-Text Revision (DSM-IV-TR)* (American Psychiatric Association, 2000). Autism is characterized by markedly impaired verbal and nonverbal

communication; deficits in socialization and reciprocal social interaction; and restricted, repetitive, and stereotyped patterns of behavior (American Psychiatric Association, 2000). In addition, terms such as *high functioning autism* and *Asperger syndrome* have been used to describe individuals with less impairment in language usage and cognitive development, but who still have serious impairment in social interactions (California Department of Developmental Services, 2002; Graziano, 2002; Ozonoff et al., 2003). In fact, there can be wide variability in individual functioning within the category of autism, and unevenness of development is the hallmark of autism, with some persons having typical ability in selected areas (California Department of Developmental Services, 2002). Nonetheless, impaired communication, deficits in socialization, and stereotyped behavior patterns are the three characteristics essential for a diagnosis of autistic disorder (American Psychiatric Association, 2000).

Autism was also once thought to be relatively rare, with population estimates of approximately 2 to 4 children per 10,000 (Graziano, 2002). However, current esti-

mates in the United States indicate the prevalence may be as high as 20 children per 10,000—for approximately 116,000 children with autism aged 1 to 15 years, and approximately 550,000 individuals with autism across all ages (Graziano, 2002). In regard to prevalence across race, a recent study including White, African American, and Asian or Pacific Islander children aged 3 to 10 years found prevalence was similar across race, with 3.4 children per 1,000 for both White and African American children, and 2.9 per 1,000 for Asian or Pacific Islander children (Yeargin-Allsop et al., 2003). One reason for the possible increase in prevalence is a recognition that the major characteristics of autism can occur to varying degrees in large numbers of people of any age (Graziano, 2002). If disorders across the spectrum of PDD are included, such as Rett's syndrome, Asperger syndrome, and pervasive developmental disorder not otherwise specified, the prevalence rate may be as high as 91 per 10,000, for approximately 2,500,000 individuals across all ages in the United States (Howlin, 1998; Graziano, 2002). Rates of autism are typically four to five times higher in males than in females (American Psychiatric Association, 2000).

The development of supported employment has been important for individuals with severe disabilities, including people with autism, to secure employment in competitive, integrated work settings (Gilmore, Schuster, Timmons, & Butterworth, 2000; Hanley-Maxwell, Owens-Johnson, & Fabian, 2003; Muller et al., 2003). The comprehensive nature of supported employment services, including development and provision of ongoing supports, has resulted in a service technology that can respond to the needs of customers with severe disabilities in the workplace (Hanley-Maxwell et al., 2003; Wehman, West, & Kregel, 1999). As a result, supported employment has increased the employability of people with autism (Smith et al., 1995). And, with an increased focus on both competitive employment for people with disabilities and provision of services to people with severe disabilities by state and federal vocational rehabilitation (VR) agencies, supported employment is an important service technology (Council of State Administrators of Vocational Rehabilitation, 2004; Gilmore et al., 2000).

However, not all individuals with severe disabilities receiving VR services may need, or participate in, supported employment. For example, when examining customers with severe disabilities, regardless of type of disability, and successful closure into either competitive or supported employment, the Disability Research Institute (2003) in the Longitudinal Study of the Vocational Rehabilitation Services Program reported that 96% of customers with severe disabilities were closed in competitive employment and 4% in supported employment. These percentages were similar for White customers with severe disabilities (95% and 5%, respectively) and African American customers with severe disabilities (95.2% and 4.8%,

respectively). Ninety-five percent of White customers with the most severe disability were closed into competitive employment, with 5% closed successfully in supported employment, and 86.6% of African American customers with the most severe disability were closed in competitive employment, with 13.4% closed successfully in supported employment (<http://compaq.ncsa.uiuc.edu:8080/vrsp/do/overview>).

Hayward and Schmidt-Davis (2003b), reporting on the Longitudinal Study of the Vocational Rehabilitation Services Program, noted that supported employment was provided to 31.9% of customers with a primary disability of mental retardation (MR), 12.8% of customers with traumatic brain injury (TBI), and 10.7% of customers with mental illness (MI). Considering only customers with MR, cerebral palsy, or epilepsy, Gilmore et al. (2000) noted that supported employment represented approximately 36% of successful closures. Hayward and Schmidt-Davis (2003b) also found that supported employment was not a service provided to customers with a primary disability of learning disability, orthopedic or nonorthopedic impairment, hearing or vision impairment, or substance abuse. Although little quantitative research exists on customer demographic and case service variables related to employment outcomes for individuals with autism, these relationships have been examined in other studies. For example, Hayward and Schmidt-Davis (2003a) examined customer demographic variables and employment outcomes and found race to be related to achieving an employment outcome, with customers other than White statistically less likely to have a successful employment outcome. However, age, not race, was found to be statistically significantly related to successful competitive employment, with younger participants more likely to be competitively employed. When examining case service variables and successful closure in competitive employment, Hayward and Schmidt-Davis (2003a) found job placement and on-the-job training to be statistically significantly related to successful closure in competitive employment, while receipt of supported employment was negatively related to successful closure in competitive employment. However, of the two categories, competitive and noncompetitive, supported employment was considered to be noncompetitive employment (noncompetitive employment is defined as participation in supported employment and sheltered workshops; Hayward & Schmidt-Davis, 2003a).

In addition, a number of studies have examined customer demographic and case service variables related to employment outcomes for people with mental retardation. This research is included here for comparison purposes, as customers with mental retardation have historically participated in supported employment, and a review of the literature revealed no quantitative studies on customer demographic and case service variables related to sup-

ported employment outcomes for people in disability categories such as mental illness and traumatic brain injury who might also receive supported employment services. Although mental retardation and autism are both developmental disabilities, each has its own characteristics, and inclusion of research on employment outcomes for customers with mental retardation is not meant to confuse or stereotype characteristics of either disability (Graziano, 2002; Muller et al., 2003).

Moore, Alston, Donnell, and Hollis (2003) found that customer race was statistically significantly related to successful closure for customers with mild mental retardation, with White customers having a higher rate of successful closure. Moore (2001) examined relationships among customer characteristics, services provided, and employment outcomes for people with mental retardation. Moore (2001) found that for individuals with either mild or moderate mental retardation, client race was significantly related to successful closure, with White customers having a higher closure rate than African American customers. He also found that services such as on-the-job training, job placement, transportation, and maintenance were statistically related to successful closure, and that more White customers received on-the-job training and job placement services than African American customers during the fiscal year of data analyzed.

Moore, Feist-Price, and Alston (2002a), using data from a midwestern state, found that for individuals with mild and moderate mental retardation, service variables of transportation, adjustment, and job placement were statistically significantly related to competitive employment outcomes, whereas variables such as gender, race, and secondary disability were not statistically significant. However, for customers with severe or profound mental retardation, Moore, Feist-Price, and Alston (2002b) found that race and job placement were statistically significantly related to successful rehabilitation closure, but none of the six consumer/service variables (e.g., race, business or vocational training, job placement) entered were statistically significant predictors for income after closure. In addition, Moore et al. (2002b) found no difference in provision of job placement services based on race at the same level of mental retardation.

Customers in competitive employment may work more average hours per week and have higher average earnings per week than customers in supported employment. Gilmore et al. (2000) noted that the number of hours worked per week and earnings per week were lower for individuals in supported employment than for individuals in competitive employment, and that this finding occurred in each of the 3 years of data analyzed over a 5-year period (1991–1995). Hayward and Schmidt-Davis (2003b) also found that customers in competitive employment worked more average hours per week and had higher average earnings per week than customers in noncompetitive em-

ployment. Noncompetitive employment was defined as including both jobs in supported employment and jobs for which individuals did not have to compete in the open labor market.

At the time of this study, no studies were found that examined quantitative employment outcomes for customers with autism. Therefore, it was of interest to examine differences between individuals with autism who received services for competitive employment without provision of supported employment and individuals who received supported employment services. The purpose of the study was to examine the following research questions:

1. Are customers with autism who received services for competitive employment statistically significantly different from customers with autism who received supported employment services on successful case closure rates, hours worked per week, earnings per week, and average case service cost?
2. Are customer demographic and case service variables statistically significantly related to successful closure in competitive employment for customers with autism who did not receive supported employment services?
3. Are customer demographic and case service variables statistically significantly related to successful closure in competitive employment for customers with autism who did receive supported employment?

METHOD

The design for this study was correlational, statistically measuring alternative explanations for successful closure (Campbell & Stanley, 1963; Shadish, Cook, & Campbell, 2002).

Participants

Participants were the 450 customers with autism who received services for competitive employment and 365 customers with autism who received supported employment services, for a total of 815 individuals, in the national Rehabilitation Services Administration (RSA) 911 database for 2001, the most recent national data file available at the time of the study. The RSA (1995) reporting manual for the case service report lists a category of autism (code 526) under mental and emotional conditions. This is the sole listing for all individuals with disabilities under the pervasive developmental disorders (PDD) category in the *DSM-IV-TR* (American Psychiatric Association, 2000).

In the RSA 911 database for 2001, there was a total of 1,323 individuals with autism. However, only customers who had received services for competitive employment or supported employment were included in the study. As a result, the 106 individuals who had received services for extended employment (i.e., sheltered workshops) and the 7 individuals in other closure categories (homemaker, 1; self-employed, 4; unpaid family worker, 2) were not included. In addition, 264 individuals had been closed before a rehabilitation program had been initiated, and there were 131 missing cases. Table 1 includes descriptive information on demographic characteristics for the 450 customers with autism who received competitive employment services and the 365 customers with autism in supported employment.

Participants Receiving Competitive Employment Services. Participants with autism receiving competitive employment services represented 55.2% of the 815 individuals in the sample. Of these participants, males represented 84.2%; 80.2% were White, 14.2% African American, 2.9% Asian or Pacific Islander, and 2.7% Hispanic. The mean age was 25.3 years (range 17–64; $SD = 7.69$). Slightly more than 83% were 15 to 30 years old; 62.2% had 10 to 12 years of education, and 24.4% had been in special education. The great majority of individuals, 98%, were categorized as having a severe disability, while 45.3% had a secondary disability. Secondary disabilities were widely represented across 18 categories, with the five largest categories in descending order: other specified disorders of the nervous system (41 individuals, 9.1%), mild mental retardation (36 individuals, 8%), neurotic disorders (28 individuals, 6.2%), moderate MR (25 individuals, 5.5%), and mental/emotional disorders (22 individuals, 4.9%). Primary source of support at application was measured across 10 categories in the 911 database; however, the following four categories accounted for 92.5% of the individuals: client income (33 individuals, 7.3%), family and friends (265 individuals, 58.8%), public assistance with federal funds (96 individuals, 21.3%), and Social Security Disability Income (23 individuals, 5.1%). Finally, 435 individuals, or 96.6%, had never been married.

Participants in Supported Employment. Participants with autism receiving supported employment services represented 44.8% of the 815 individuals in the sample. Males represented 87.9% of the sample; there were 76.2% White, 15.1% African American, 4.7% Asian or Pacific Islander, and 4.1% Hispanic individuals. The mean age was 27.3 years (range 18–64; $SD = 7.23$). Slightly more than 73.7% of participants were between the ages of 15 and 30 years; 61.4% had 10 to 12 years of education, and 25.5% had been in special education. All individuals who received supported employment were categorized as

having a severe disability, and 54.8% had a secondary disability. The five largest categories of secondary disability were, in descending order: mild MR (56 individuals, 15.3%), other specified disorders of the nervous system (31 individuals, 8.4%), moderate MR (30 individuals, 8.2%), mental/emotional disorders (26 individuals, 7.1%), and neurotic disorders (15 individuals, 4.1%). The four largest categories of primary source of support at application, accounting for 95.7% of individuals were client income (25 individuals, 6.8%), family and friends (157 individuals, 42.8%), public assistance with federal funds (135 individuals, 36.8%), and Social Security Disability Income (34 individuals, 9.3%). Finally, 356, or 97.5%, had never been married.

Variables and Data Analyses

The criterion variable for research questions 2 and 3 was *successful or unsuccessful closure*. Successful and unsuccessful closure was chosen, as pointed out in other studies (e.g., Wheaton & Hertzfeld, 2002), as these two statuses represent cases that have been found eligible for services and for which an Individualized Plan for Employment (IPE) had been written, agreed to by the customer or his or her legal guardian, and implemented.

The predictor variables included customer demographic and case service variables. Customer demographic variables are represented in Table 1 and included gender, ethnicity, age (presented categorically in Table 1 but used as a continuous variable in the analyses), years completed in school, secondary disability (coded as either "yes" or "no") and primary source of support at application. Case service variables are listed in Table 2.

Logistic regression was used, as there was a combination of continuous and categorical predictor variables with a categorical criterion variable (Tabachnick & Fidell, 1996). A forward logistic regression equation was run for customer demographic variables and for case service variables for research questions 2 and 3, for a total of four regression equations. Forward stepwise entry was chosen, because, as Tabachnick and Fidell (1996) point out, it may be used as a hypothesis generating technique for statistically examining relationships among variables. Indicator coding was used for all regression analyses, in which the last category in the data file for a given variable was represented in the contrast matrix as zero (SPSS, 2001). For example, males were coded 1, females 0, and presence of secondary disability was coded 1 for yes and 0 for no. The default alpha of .05 was used. As seen below, p values may be considered small enough to offset possible concerns of Type 1 error.

Distributions of all predictor variables were examined prior to analysis. It has been suggested that, ideally, distributions for dichotomous variables would be approximately 50/50; however, dichotomous variables with

TABLE 1. Demographic Characteristics of Participants

Characteristic	Competitive employment ^a		Supported employment ^b	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	379	84.2	321	87.9
Female	71	15.8	44	12.1
Ethnicity				
African American	64	14.2	55	15.1
Asian or Pacific Islander	13	2.9	17	4.7
Hispanic	12	2.7	15	4.1
White	361	80.2	278	76.2
Age group				
15-20	103	22.9	41	11.2
21-25	210	46.7	151	41.4
26-30	62	13.8	77	21.1
31-35	26	5.8	42	11.5
36-40	22	4.9	26	7.1
41-45	12	2.7	19	5.2
46-50	6	1.3	5	1.4
51-64	9	2.0	4	1.1
Years completed in school				
None	3	.7	5	1.4
1-9	19	4.2	20	5.5
10-12	280	62.2	224	61.4
13-15	21	4.7	15	4.1
16-22	17	3.8	8	2.2
Special education	110	24.4	93	25.5
Secondary disability				
No	246	54.7	165	45.2
Yes	204	45.3	200	54.8
Primary source of support				
Client income	33	7.3	25	6.8
Family & friends	264	58.7	155	42.5
Private relief agency	3	.7	0	0
Public assistance with federal funds	96	21.3	135	37.0
Public assistance without federal funds	5	1.1	0	0
Public institution, tax supported	2	.4	2	.5
Social Security Disability Insurance	23	5.1	34	9.3
Other public source	5	1.1	7	1.9
Annuity or nondisability insurance	2	.4	0	0
Other source of support	17	3.8	7	1.9

Note. *N* = 815.^a*n* = 450. ^b*n* = 365.

distributions of 80%–20% are appropriate for logistic regression. Stevens (1996) has suggested that dichotomous variables with distributions greater than this range (e.g., 95%–5%) should not be considered for the analysis. Distributions of case service variables for individuals receiving competitive employment were acceptable and included in the analysis. However, for individuals in supported employment, the case service variables of college training and business or vocational training were not included as they were over the 95%–5% distribution.

The demographic of age was a continuous variable for individuals in both competitive and supported employment. Distributions for age for individuals in competitive and supported employment, while slightly positively skewed, were reasonably normally distributed, with skewness = 1.51 and kurtosis = 1.55 for individuals in competitive employment and skewness = 1.26 and kurtosis = 1.18 for individuals in supported employment (Tabachnick & Fidell, 1996). The demographic variables of marital status and severity of disability were not included in the analy-

TABLE 2. Types of Services Provided

Services		Competitive employment ^a		Supported employment ^b	
		<i>n</i>	%	<i>n</i>	%
Assessment	no	108	24.0	84	23.0
	yes	342	76.0	281	77.0
Restoration	no	410	91.1	338	92.6
	yes	40	8.9	27	7.4
College/university training	no	417	92.7	360	98.6
	yes	33	7.3	5	1.4
Business/vocational training	no	417	92.7	356	97.5
	yes	33	7.3	9	2.5
Adjustment training	no	336	74.7	272	74.5
	yes	114	25.3	93	25.5
On-the-job training	no	402	89.3	303	83.0
	yes	48	10.7	62	17.0
Miscellaneous training	no	330	73.3	251	68.8
	yes	120	26.7	114	31.2
Counseling, substantial	no	115	25.6	101	27.7
	yes	335	74.4	264	72.3
Job-finding services	no	241	53.6	135	37.0
	yes	209	46.4	230	63.0
Job placement	no	285	63.3	148	40.5
	yes	165	36.7	217	59.5
Transportation	no	352	78.2	286	78.4
	yes	98	21.8	79	21.6
Maintenance	no	411	91.3	339	92.9
	yes	39	8.7	26	7.1
Other services	no	353	78.4	259	71.0
	yes	97	21.6	106	29.0

Note. *N* = 815.

^a*n* = 450. ^b*n* = 365.

sis, as the vast majority of individuals in both competitive employment and supported employment had never been married and were considered as having a severe disability.

In addition, Pearson and Kendall's tau-b correlations were run on predictor variables. Intercorrelations among predictor variables ranged from .023 to .204, and it was determined that these values were low enough to preclude issues of multicollinearity. The statistical program SPSS version 11 was used for all analyses.

RESULTS

For research question 1, customers with autism who received services for competitive employment were statistically significantly different from customers with autism

who received supported employment services on successful case closure rates, hours worked per week, earnings per week, and average case service cost. The overall successful closure rate for customers in competitive employment was 263 out of 450, for 58.4%; for customers in supported employment, the rate was 275 out of 365, for 75.3%, which was statistically significant ($\chi^2 = 25.64$; $p = .00$). Closure rates by ethnicity for customers in competitive employment and supported employment are listed in Table 3.

The average hours worked per week for customers in competitive employment were 27.19 ($SD = 11.36$), and the average hours worked per week for customers in supported employment were 22.21 ($SD = 10.33$), which was statistically significant ($t = 5.31$; $p = .00$). The average weekly earnings at closure for customers in competitive

employment were \$205.31 ($SD = \132.90), and the average weekly earnings at closure for customers in supported employment were \$138.35 ($SD = \84.87), which was statistically significant ($t = 6.99$; $p = .00$).

The mean cost of services for customers successfully closed in competitive employment was \$3,341.14 ($SD = \$5,744.$); for customers in supported employment, it was \$6,882.46 ($SD = \$9,497$), which was statistically significant ($t = 6.56$; $p = .00$).

In regard to research question 2, for participants who received competitive employment services, results of the

logistic regression for customer demographic variables and case service variables are in Table 4. Of the six customer demographic predictor variables entered into the equation, age ($\beta = .038$, $SE = .015$, $Wald = 6.504$, $p = .011$, $Exp(\beta) = 1.039$); 10–12 years of education ($\beta = .668$, $SE = .233$, $Wald = 8.194$, $p = .004$, $Exp(\beta) = 1.950$) and 13–15 years of education ($\beta = 1.543$, $SE = .593$, $Wald = 6.766$, $p = .009$, $Exp(\beta) = 4.678$); and not having a secondary disability ($\beta = .430$, $SE = .202$, $Wald = 4.547$, $p = .033$, $Exp(\beta) = 1.537$) were statistically significantly related to successful closure. Correct classification or hit

TABLE 3. Frequency and Percentage of Participant Ethnicity by Type of Closure

Ethnicity	Unsuccessful closure		Successful closure		Total
	<i>n</i>	%	<i>n</i>	%	
Competitive employment					
Black	29	45.3	35	54.7	64
Asian or Pacific Islander	5	38.5	8	61.5	13
Hispanic	4	33.3	8	66.7	12
White	149	41.3	212	58.7	361
Total	187	41.6	263	58.4	450
Supported employment					
Black	21	38.2	34	61.8	55
Asian or Pacific Islander	7	41.2	10	58.8	17
Hispanic	1	6.7	14	93.3	15
White	61	21.9	217	78.1	278
Total	90		275		365

TABLE 4. Summary of Forward Stepwise Logistic Regression for Competitive Employment

Predictors	β	<i>SE</i>	Wald	ρ	Exp. β
Equation 1					
Demographic variable					
Age	.038	.015	6.504	.011	1.039
Years of education			12.642	.027	
None	1.182	1.244	.903	.342	3.260
1–9	.365	.512	.508	.476	1.440
10–12	.668	.233	8.194	.004	1.950
13–15	1.543	.593	6.766	.009	4.678
16–22	.952	.635	2.246	.134	2.591
Secondary disability	.430	.202	4.547	.033	1.537
Constant	–1.386	.432	10.301	.001	.250
Equation 2					
Case service variables					
Job-finding services	1.038	.261	15.873	.000	2.824
Job placement	1.349	.292	21.402	.000	3.852
Maintenance	1.101	.407	7.334	.007	3.008
Constant	–.603	.143	17.815	.000	.547

rate for this model was 62.9% (see Table 5). For this model, the Cox and Snell R^2 was .064, and the Nagelkerke R^2 was .087.

Of the 13 case service variables entered into the equation, job finding ($\beta = 1.038$, $SE = .261$, $Wald = 15.873$, $p = .000$, $Exp(\beta) = 2.824$), job placement ($\beta = 1.349$, $SE = .292$, $Wald = 21.402$, $p = .000$, $Exp(\beta) = 3.852$), and maintenance ($\beta = 1.101$, $SE = .407$, $Wald = 7.334$, $p = .007$, $Exp(\beta) = 3.008$) were statistically significant. The hit rate, or correct classification, for this model was 72.9% (see Table 5). For this model, the Cox and Snell R^2 was .199, and the Nagelkerke R^2 was .268.

It may be remembered that per the RSA (1995) case reporting manual, an individual who received job placement services by definition also received job finding services, but not necessarily the reverse. Practically speaking, for participants in competitive employment, an individual's increased age, not having a secondary disability, and having received job finding or job placement and maintenance services were statistically significantly related to successful closure.

For research question 3, results of each logistic regression for customer demographic and case service variables are in Table 6. Of the six customer demographic variables entered into the equation, only ethnicity was statistically significant, with African American ($\beta = -.787$, $SE = .313$, $Wald = 5.417$, $p = .012$, $Exp(\beta) = .455$) negatively associated with successful closure. Correct classification or hit rate for this model was 75.3% (see Table 5). For this model the Cox and Snell R^2 was .065 and the Nagelkerke R^2 was .096.

Of the 11 case service variables entered into the equation, job placement ($\beta = 1.061$, $SE = .250$, $Wald = 18.007$, $p = .000$, $Exp(\beta) = 2.888$) was the only variable statistically significantly related to successful closure. The hit rate or correct classification for this model was 75.3% (see Table 5). For this model the Cox and Snell R^2 was .049 and the Nagelkerke R^2 was .073.

Practically speaking, for individuals in supported employment, being African American was statistically significantly negatively related to successful closure, while receiving job placement services was statistically significantly related to successful closure.

DISCUSSION

Research Question 1

Results of the present study indicate that customers closed in supported employment had a statistically significantly higher overall successful closure rate (75.3%) than customers closed in competitive employment (58.4%) for the fiscal year of data analyzed. These rates compare with an overall successful closure rate of 46.3% for individuals with severe/profound MR in Moore et al. (2002b), a 63.9% for individuals with mild/moderate MR in Moore (2001), and a 39% success rate for individuals with MR, cerebral palsy, and epilepsy in Gilmore et al. (2000). In addition, Moore et al. (2003), when using two samples, reported overall success rates of 71.9% and 73.6% for White customers with mild MR in comparison with 60.4% and 57.2% for African American customers with mild MR. However, the rates from Gilmore et al. (2000) are for competitive employment closures only.

A possible explanation for the higher closure rate for individuals in supported employment is the comprehensive nature of the provision of supported employment services (Hanley-Maxwell et al., 2003; Smith et al. 1995). Although all IPEs may be comprehensive in nature and developed with the aim of job retention by the customer, supported employment services may be more so, in that the service has historically featured development and provision of ongoing supports as a key element of service provision. This is in contrast to a historical focus on time-limited services in state-federal VR (Bruyere & Brown,

TABLE 5. Summary of Forward Stepwise Logistic Regression for Supported Employment

Predictors	β	SE	Wald	p	Exp. β
Equation 1					
Demographic variables					
Ethnicity			10.768	.013	
African American	-.787	.313	6.321	.012	.455
Asian or Pacific Islander	-.912	.514	3.155	.076	.402
Hispanic	1.370	1.045	1.718	.190	3.934
Constant	1.269	.145	76.680	.000	3.557
Equation 2					
Case service variables					
Job placement	1.061	.250	18.007	.000	2.888
Constant	.554	.171	10.538	.001	1.741

TABLE 6. Summary of Classification of Prediction by Closure Type

	Competitive employment			Supported employment		
	Unsuccessful closure	Successful closure	% Correct	Unsuccessful closure	Successful closure	% Correct
Equation 1						
Demographic						
Unsuccessful	62	125	33.2	0	90	.0
Successful	42	221	84.0	0	275	100.0
Overall			62.9			75.3
Equation 2						
Case service						
Unsuccessful	132	55	70.6	0	90	.0
Successful	67	196	74.5	0	275	100.0
Overall			72.9			75.3

2003). As a result, although there are certainly customers with autism who can hold a job independently, there are many individuals with autism who cannot retain a job without support from qualified staff, and it may be this core feature of supported employment that contributed to a higher success rate (Smith et al., 1995).

The higher successful closure rate in supported employment was offset by a statistically significantly higher average case service cost, in comparison to the average case service cost for successful closures in competitive employment. In addition, customers in competitive employment worked statistically significantly more hours per week at higher earnings per week than customers closed in supported employment. This finding is similar to Gilmore et al. (2000), who also found that individuals with MR, cerebral palsy, or epilepsy closed in competitive employment worked more hours per week and had higher earnings per week than individuals closed in supported employment. A possible explanation for customers in competitive employment having higher earnings per week than customers in supported employment is that the jobs that are appropriate for individuals with autism in supported employment, who require the presence of a job coach, may simply pay less than jobs in competitive employment for individuals who do not require a job coach.

Another speculative hypothesis as to why customers in competitive employment had higher earnings per week than customers in supported employment in the present study may be a greater concern for individuals in supported employment with staying below substantial gainful activity (SGA) levels and continuing to receive full Supplemental Security Income (SSI) benefits, than for individuals in competitive employment. In this study, a larger percentage of customers in supported employment received public assistance than customers in competitive employment, as reflected in Table 1. Although the aver-

age earnings per week for individuals in competitive employment were over the SGA level, these individuals could still use impairment-related work expenses (IRWEs) to lower their income below SGA levels. If customers in competitive employment who earned over the SGA level did not use IRWEs to lower their income and continue to receive full SSI benefits, it may be possible that they therefore had to rely on family and friends to a greater extent than customers in supported employment to make up for the support they would have continued to receive from full Social Security benefits.

Research Question 2

For customers with autism in competitive employment, considering demographic variables only, the demographic variables statistically significantly related to successful closure were increased age, 10 to 12 and 13 to 15 years of education, and not having a secondary disability. In the present study, as age increased from 21 years up to 45 years, so did the percent of individuals closed successfully within each age group. Greater age has been associated with increased education, work experience, and life experience that may assist one with getting and keeping a job (Ozonoff et al., 2003).

In comparison, Hayward and Schmidt-Davis (2003a) reported increasing age as a demographic variable negatively statistically significantly related to closure into competitive employment. In the Hayward and Schmidt-Davis report, percentages of participants closed successfully in competitive and noncompetitive employment increased when age ranged from 22 to 49 years. However, mean age for participants in the Hayward and Schmidt-Davis report who were closed successfully in competitive employment was 41.9 years, and for participants closed successfully in noncompetitive employment, it was 50.0

years. This is in comparison with a mean of 25.3 years for customers with autism in competitive employment and a mean of 27.3 years for customers with autism in supported employment in the present study.

The finding of 10 to 12 and 13 to 15 years of education as statistically related to successful closure could be a result of individuals moving from school to adult services and the linkages between the two assisting in getting and keeping a job. Or it could be an artifact of the data in that the overwhelming majority of individuals who received competitive employment services had between 10 and 12 or between 13 and 15 years of education, outside of individuals in special education.

The lack of a secondary disability was also related to successful closure. The successful closure rate for individuals in competitive employment without a secondary disability was 63.8% (157 of 246 individuals), while the successful closure rate for individuals with a secondary disability was 52% (106 individuals of 204). In comparison, Moore et al. (2002a) did not find having a psychiatric secondary disability as being negatively related to successful closure when examining competitive employment outcomes for individuals with mild and moderate MR. In the present study, a number of issues could have contributed to this finding. For example, it is not clear whether customers with autism were assessed as having the capability of working without the support of a job coach; the combination of autism, presence of a secondary disability, and the possible supports necessary for success on the job may have contributed to the lower successful closure rate for individuals in competitive employment. Customers with autism may have received competitive employment services due to the lack of availability of supported employment services, for while availability of supported employment services has grown over the years, it is not a service found in all communities across the country (Wehman et al., 1999). This is speculative, as other issues could have been present such as family concerns for the individual's functioning in the community or coworker concerns related to an individual with autism.

When considering case service variables only, three case service variables, job finding, job placement, and maintenance, were statistically significantly related to successful closure for customers in competitive employment. Not surprisingly, these three had the highest successful closure rates for the individuals who received them, with job finding at 78.9% (165 of 209 individuals), job placement at 84.2% (139 of 165 individuals), and maintenance at 74.4% (29 of 39 individuals).

The case service variables of job development and job placement were two of the case service variables reported to be positively statistically significantly related to successful closure in competitive employment by Hayward and Schmidt-Davis (2003b). Moore (2001) has also found job placement and maintenance to be linked with closure

success, as has Moore et al. (2002a; 2002b) for job placement. Again, job placement is defined as being referred to and hired by an employer; however, the employment still needs to be successful, and it is heartening to find that 84.2% of the customers with autism who received this service were closed successfully into competitive employment. Similarly, for individuals who received job finding services, meaning they either interviewed with or were referred to an employer, the 78.9% success rate is also a most positive sign. Job placement and job finding services have historically been a cornerstone of VR services, and the more recent focus on competitive employment for individuals with severe disabilities in VR service provision would seem to indicate that customers with autism who receive these services are functioning successfully on their jobs to the extent that the file may be closed successfully (Gilmore et al., 2000).

Research Question 3

When considering only demographic variables for customers with autism who received supported employment services, being African American was negatively statistically significantly related to successful closure. Hayward and Schmidt-Davis (2003a), in examining customer demographic variables and an overall successful employment outcome, found customers other than White statistically less likely to have a successful employment outcome. Moore (2001) has found that African American customers with mild or moderate MR were statistically significantly less likely to be closed successfully than White customers with mild or moderate MR; and, this finding also held for African American customers with either severe or profound MR in comparison to White customers with either severe or profound MR (Moore et al., 2002b). Moore et al. (2002a), however, did not find race as a variable related to successful closure when examining customers with either mild or moderate MR with or without a secondary psychiatric disability.

Ozonoff et al. (2003) have suggested that, in comparison to the overall empirical research base on autism, the research base on cultural or racial factors and autism is quite small, as many autism-related studies do not include culture or race as variables, and therefore there is little empirical data to provide a framework for discussion. It has been suggested that, as the severity of disability increases, so too should the importance of the level of rehabilitation counselors' cultural sensitivity and competence for successful VR outcomes (Moore et al., 2002b). This seems a speculative, although not implausible, hypothesis at this time. Currently, little is known about how culture or race may influence family responses to a member with autism, as well as developmental skill patterns of an individual with autism and interactions with service professionals including rehabilitation counselors. In addition,

when professionals provide services for individuals with severe multiple disabilities, the magnitude of the disability may overshadow culture or race variables, resulting in a lack of appropriate attention to cultural and linguistic factors in providing both evaluations and services.

Finally, when considering case service variables only, job placement was the sole case service variable statistically related to successful closure for individuals in supported employment. Of the 217 individuals who received job placement services, 181, or 83.4%, were closed successfully. As noted previously, job placement has been found to be statistically related to successful VR outcomes in a number of other studies with people with mental retardation (Moore et al., 2002a, 2002b). For the present study, although the overall successful closure rate was higher for customers closed into supported employment than for customers closed into competitive employment, the percentages for successful closures for individuals receiving job placement services were similar for individuals in supported employment and in competitive employment (83.4% vs. 84.2%). However, a factor contributing to the higher overall successful closure rate for individuals in supported employment was the successful closure rate for individuals who did not receive job placement services, which was 63.5% (94 of 148) for individuals in supported employment in comparison to 43.5% (124 of 285) for individuals in competitive employment.

Limitations

There are a number of limitations to this study that affect internal and external validity. Nonprobability sampling was used; therefore, it is not possible to estimate sampling error, and validity of inferences to other populations is limited (Pedhazur & Schmelkin, 1991; Shadish et al., 2002). Also, the best use of logistic regression, as viewed by some statisticians, is as a screening or hypothesis-generating procedure and a statistic that can be sample specific (Tabachnick & Fidell, 1996). As a result, even if another sample of people with autism were analyzed (and randomly sampled), it is possible that statistically significant findings may vary. In addition, this study used one fiscal year of data, and analyses of other fiscal years of data may provide different findings. Also, the regression models for customers who received competitive and supported employment services are underspecified for two reasons. First, demographic and case service variables were examined separately for customers who received competitive and supported employment services; therefore, possible interactions of demographic and case service variables were not examined. In addition, Bolton, Bellini, and Brookings (2000) have demonstrated the importance of simultaneous analyses of at least three data elements that include customer demographic information, functional limitations, and case services when examining customer

employment outcomes. The fact that this study included two data elements consisting of customer demographic and case service variables also contributed to underspecification of the regression models.

Implications for Practice and Future Research

It is possible that VR counselors may be providing services to a growing number of customers with autism due to the possible increase in prevalence of individuals with autism (Graziano, 2002) and an increasing demand for VR services that could push state VR agencies to implement an order of selection process and therefore provide services to customers based on significance of disability and number of functional limitations (Council of State Administrators of Vocational Rehabilitation, 2004). As a result, there are potential implications for VR counselors.

The first is the determination of type and level of support needs of customers with autism (Smith et al., 1995). In the present study, a higher percentage of customers with autism received supported employment (44.8%) than has been reported for customers with severe disabilities in general (4%; Disability Research Institute, 2003) and disabilities such as mental retardation (31.9%), traumatic brain injury (12.8%), and mental illness (10.7%; Hayward & Schmidt-Davis, 2003b). Customers with autism may need varying levels of support across a variety of domains including behavioral issues, communication and social skills, responses to change, and instructional strategies. A lack of support may result in productivity problems, or social or behavioral issues, while too much support may inhibit the individual's growth in the job. In addition, an individual with autism may be participating in competitive or supported employment for the first time, and the technology of their support on the job may be continuing to evolve (Smith et al., 1995). Decisionmaking about levels of support for a customer with autism requires collecting comprehensive information from a variety of sources across several contexts, including employment sites and the community in general. This process often needs to be ongoing as an individual responds to the job and the environment. As mentioned previously, the finding in the present study of secondary disability being negatively related to successful closure into competitive employment for customers with autism may suggest that customers with autism in the present study who also had a secondary disability had higher support needs than could be successfully met in competitive employment. Again, this is speculative, as other issues such as family concerns for the individual being in the community or coworker concerns related to an individual with a disability of autism could have affected successful employment. Nonetheless, as many individuals with autism may be working in the community for the first time,

continued improvement in determining support needs for customers with autism may be critical for employment success (Smith et al., 1995).

For customers with autism in supported employment, the finding that African American ethnicity was statistically significantly negatively related to a successful employment outcome may also have implications. As Moore et al. (2003) have mentioned, a number of issues could have contributed to this finding, including customer factors, VR program personnel's lack of cultural knowledge and sensitivity, and employment-sector factors including discrimination toward an individual based on severe disability and race. Even though one or all of these issues could have contributed to the above finding, a number of authors have suggested the need for multicultural training for rehabilitation counselors (Herbert & Cheatham, 1998; Moore et al., 2003; Wheaton & Hertzfeld, 2002). In addition, given the lack of empirical research on cultural or racial factors and autism (Ozonoff et al., 2003) and the suggestion that as the severity of disability increases, so too should the importance of the level of rehabilitation counselors' cultural sensitivity (Moore et al., 2002b), multicultural training may need to also address severity of disability while acknowledging that future research in the area of autism needs to include culture and race as variables.

There are a number of implications for future research. First, there is a need for additional studies examining outcomes for individuals with autism in general, especially if the number of individuals with autism receiving VR services increases. Second, studies on employment outcomes for people with severe disabilities may need to examine similarities and differences of customers who receive competitive employment services separately from those of customers receiving supported employment. This information may highlight not only potential differences in individuals receiving services but also service delivery issues. Finally, with an increased focus by state-federal VR agencies on both competitive employment for people with disabilities and provision of services to people with severe disabilities, research over multiple years of national data to examine trends would be useful, not only for comparison of findings but also for documenting progress in service provision to customers with autism, as well as to customers with severe disabilities.

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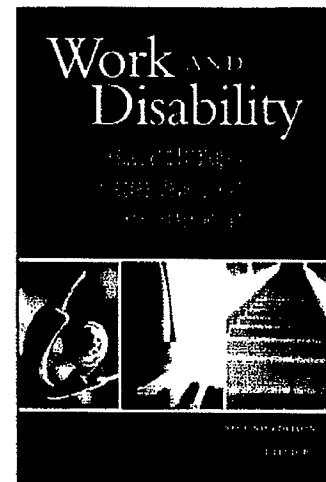
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Autism after Adolescence: Population-based 13- to 22-year Follow-up Study of 120 Individuals with Autism Diagnosed in Childhood

Eva Billstedt,^{1,3} Carina Gillberg,¹ and Christopher Gillberg^{1,2}

Background: Prospective population-based follow-up study of 120 individuals with autism followed from childhood to adulthood. **Methods:** Individuals with autism, diagnosed in childhood, were followed prospectively for a period of 13–22 years and re-evaluated at ages 17–40 years. The instruments used at follow-up were the DISCO, WAIS-R, WISC-III, Vineland Adaptive Behavior Scales, psychiatric-medical examination and GAF-scale. A set of criteria was used for the classification of outcomes, taking into consideration employment, higher education/vocational training, independent living and peer relations. **Results:** Six of the 120 (5%) had died at the time of follow-up, and six declined participation. Overall outcome was poor in 78% of cases. Only four individuals were independent albeit leading fairly isolated lives. Childhood IQ-level was positively correlated with better adult outcome, as was the existence of some communicative phrase speech at age six years. **Conclusions:** Children with autism as diagnosed in the 1960s, 1970s, and 1980s may have an even worse psychosocial outcome than previously believed.

KEY WORDS: Autism; epidemiology; outcome; epilepsy; adolescence.

INTRODUCTION

Follow-up studies of autism performed in the 1970s and 1980s indicated that the intermediate-term outcome is variable but, on average, psychosocially poor (Gillberg, 1991; Lotter, 1978; Nordin & Gillberg, 1998). According to these studies, about two thirds of people with autism had no indication of independence (work, education, independent living) in early adult life. There was a high rate of epilepsy in early childhood and adolescence (Olsson, Gillberg, & Steffenburg, 1988; Volkmar & Nelson 1990), and possibly a higher rate of

poor outcome in the epilepsy subgroup (Kobayashi & Murata, 1998). Females with autism appeared to do worse than males. Symptom aggravation and deterioration were frequent complications, particularly in those with epilepsy (Gillberg & Steffenburg 1987). A tendency towards poorer outcome in the group with "classic" autism than in those with autistic-like conditions was noted by some authors (Nordin & Gillberg, 1998).

Recent studies of the short-term outcome have suggested a substantially better prognosis in many cases. This may have been due to earlier and more effective interventions, to the inclusion of proportionately more high-functioning individuals include in the studies, or to other factors (Howlin, 1998; Lovaas, 1987; Schopler & Mesibov, 1983; Szatmari, Bartolucci, Bremner, Bond, & Rich, 1989).

Little is known about the long-term natural outcome of autism. Only a very limited number of studies have been published, and they have usually

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referred to small or selected, clinical case samples (Howlin, Mawhood, & Rutter, 2000; Isager, Mouridsen, & Rich, 1999; Kanner, 1971; Larsen & Mouridsen, 1997; Mawhood, Howlin, & Rutter, 2000; Rumsey & Hamburger, 1988). Some population-based studies have followed children prospectively from childhood through adolescence into early adulthood (Beadle-Brown *et al.*, 2002; Gillberg & Steffenburg, 1987; Lotter, 1974), but there has, to our knowledge, been no report on a reasonably large population-based case series followed from childhood into adulthood.

The present study is the first ever to present this kind of long-term epidemiological perspective on the longitudinal natural outcome of autism. It includes a fairly large group with DSM-III-R autistic disorder (American Psychiatric Association, 1987), and a comparison group of autistic-like cases, both of which were recruited from the general population of children in Göteborg, Sweden, and followed prospectively for 13–22 years until age 17–40 years.

Our hypotheses—based on the aforementioned published studies and reviews of autism outcome—were that (i) autism would have a psychosocially poor outcome with about two thirds of individuals showing no independence in early adult life, (ii) would be associated with a history of/current epilepsy in about one third of the group, and that the subgroup with epilepsy would have a particularly high rate of pubertal aggravation, and a higher rate of very poor outcome compared to the subgroup without epilepsy, (iii) would be associated with poorer outcomes in females than in males, and (iv) would have a significantly worse outcome in the core condition (autistic disorder) than in the atypical variant (autistic-like condition).

PARTICIPANTS AND METHODS

Outline of Population Samples

One hundred and twenty individuals (84 males, 36 females,) with autistic disorder/infantile autism (61 males, 17 females) or autistic-like conditions/atypical autism (23 males, 19 females) were included in the study (see below for definitions). They had all been recruited in population-based studies of autism performed in Gothenburg, Sweden in the 1980s (Gillberg, 1984; Gillberg, Steffenburg, & Schaumann, 1991; Steffenburg & Gillberg, 1986). All had been diagnosed after in-depth examination in childhood and were followed prospectively for a period of 13–22 years

and re-evaluated at ages 17–40 years (mean age 25.5 years). The ratio of autistic disorder to atypical autism was 2.4:1. The 120 cases included comprised *all* cases included in three *population-based* studies. These studies had all screened for autism in all clinics, hospitals, university departments, and schools in one geographical region with the aim of identifying all children with the condition born in a specific period of time and living in the region on a specific census day. The first study included 51 children, 26 of whom met the 1978 criteria by Rutter (1978) and the DSM-III-criteria (American Psychiatric Association, 1980) for infantile autism—later shown to meet also the DSM-III-R-criteria for autistic disorder. The majority of this group has been followed-up once before (in the 1980s) at ages 16–23 years (Gillberg & Steffenburg, 1987). The second study included 52 children, 35 of whom met criteria for DSM-III-R autistic disorder. Six children in the second study were also included in the first study, meaning that the total number remaining after pooling the two cohorts was 97. The third study included 75 children, 55 of whom met criteria for DSM-III-R autistic disorder. All 52 cases included in the second study were also included in the third study. Thus, when pooling the cohorts of all three studies, we were left with 120 individuals.

These 120 individuals (78 with DSM-III-R autistic disorder and 42 with autistic-like conditions) are reasonably representative of all children with autistic disorder/autistic-like conditions (as conceptualised in the 1980s) born in 1962–1984 and living in the Gothenburg region at the time of the original diagnostic studies. Nevertheless, there are some caveats. The Gothenburg region was slightly differently delineated at the three census dates. Also, differently from those born in 1975–1984, the population of children born in 1962–1974 was not re-screened in 1988. Finally, it was discovered in a later epidemiological study of severe mental retardation and epilepsy, that a small, but significant number of autistic disorder cases had been missed by the original screening procedures (Steffenburg, Gillberg, & Steffenburg, 1996).

Current Study Groups

Autistic Disorder

The 78 individuals with autistic disorder had all met the criteria of the DSM-III-R at the time of first being diagnosed in the original population screening studies. They had all been tested before